

CLAIMS:

1. A display drive unit for driving a display having matrix type display elements, said display drive unit comprising:

a resistive voltage-dividing circuit for dividing a display reference voltage using resistors to generate multiple bias voltages;

multiple buffer circuits for respectively converting said multiple bias voltages into output voltages through impedance conversion of said bias voltages;

a scanning drive circuit adapted to select a voltage to be applied to the scanning electrodes of said matrix type display elements from said output voltages of said multiple buffer circuits and apply the selected voltage to said scanning electrodes; and

a signaling drive circuit adapted to select a voltage to be applied to the signaling electrodes of said matrix type display elements from said output voltages of said multiple buffer circuits and apply the selected voltage to said signaling electrodes, wherein at least one of said buffer circuits includes:

a first output circuit receiving the bias voltage supplied to said buffer circuit and the output voltage of said buffer circuit, and having enhanced drive capability of providing output current to bring up said output

voltage;

a first output switch for allowing said first output circuit to output its voltage;

a second output circuit receiving the bias voltage supplied to said buffer circuit and the output voltage of said buffer circuit, and having enhanced drive capability of providing output current for bringing down said output voltage;

a second output switch for allowing said second output circuit to output its voltage; and

a voltage comparator for comparing the bias voltage supplied to said buffer circuit with the detection voltage detected at a node connected to the output end of said buffer circuit, said voltage comparator adapted to switch between said first and second output switches in accord with the comparison.

2. The display drive unit according to claim 1, wherein said voltage comparator has a hysteresis characteristic.

3. The display drive unit according to claim 2, wherein said hysteresis characteristic is set in a voltage region that does not include said bias voltage.

4. A display drive unit for driving a display having matrix type display elements, said display drive unit comprising:

a resistive voltage-dividing circuit for dividing a display reference voltage using resistors to generate multiple bias voltages;

multiple buffer circuits for respectively converting said multiple bias voltages into output voltages through impedance conversion of said bias voltages;

a scanning drive circuit adapted to select a voltage to be applied to the scanning electrodes of said matrix type display elements from said output voltages of said multiple buffer circuits and apply the selected voltage to said scanning electrodes; and

a signaling drive circuit adapted to select a voltage to be applied to the signaling electrodes of said matrix type display elements from said output voltages of said multiple buffer circuits and apply the selected voltage to said signaling electrodes, wherein one of said multiple buffer circuits (high-voltage buffer circuit) includes:

a first output circuit receiving the bias voltage supplied to said high-voltage buffer circuit and the output voltage of said high-voltage buffer circuit, and having enhanced drive capability of providing output current to bring up said output voltage;

a first output switch for allowing said first output circuit to output its voltage;

a second output circuit receiving the bias voltage supplied to said high-voltage buffer circuit and the

output voltage of said high-voltage buffer circuit, and having enhanced drive capability of providing output current for bringing down said output voltage;

a second output switch for allowing said second output circuit to output its voltage; and

a first voltage comparator for comparing the bias voltage supplied to said high-voltage buffer circuit with the detection voltage in accord with the voltage applied to the display elements not in display mode, said voltage comparator adapted to switch between said first and second output switches in accord with the comparison, and wherein another one of said multiple buffer circuits (low-voltage buffer circuit) includes;

a third output circuit receiving a bias voltage lower than the bias voltage for the high-voltage buffer circuit along with the output voltage of said low-voltage buffer circuit, and having enhanced drive capability of providing output current to bring up said output voltage;

a third output switch for allowing said third output circuit to output its voltage;

a fourth output circuit receiving the bias voltage supplied to said low-voltage buffer circuit and the output voltage of said low-voltage buffer circuit, and having enhance drive capability of providing output current to bring down said output voltage;

a fourth output switch for allowing said fourth output circuit to output its voltage; and

a second voltage comparator for comparing the bias voltage supplied to said low-voltage buffer circuit with said detection voltage, said voltage comparator adapted to switch between said third and fourth output switches in accord with the comparison, wherein:

the detection node for said detection voltage is connected to the output end of the high-voltage buffer circuit via a first selection switch and to the output end of the low-voltage buffer circuit via the second selection switch; and

either one of said first and second selection switches is selected by an alternation signal.

5. The display drive unit according to claim 4, wherein said first voltage comparator and second voltage comparator respectively have hysteresis characteristics.

6. The display drive unit according to claim 5, wherein said first voltage comparator exhibits a hysteresis in a region where said detection voltage is slightly above the bias voltage supplied to said high-voltage buffer circuit, and said second voltage comparator exhibits a hysteresis in a region where said detection voltage is slightly below the bias voltage supplied to said low-voltage buffer circuit.

7. A display, comprising:

a display drive unit according to any one of claims
1 through 6; and

a matrix type display panel driven by said display
drive unit.